WHAT IS CLAIMED IS:

1. An adaptive transmitter in a wireless communication system using frequency division duplexing, comprising:

a modulation and encoding method and transmit power determining unit for determining an antenna method, a modulation and encoding method, and a corresponding transmit power according to a parameter (a received log likelihood ratio parameter) for determining a distribution of the received log likelihood ratio fed back from a receiver; and

an encoder and modulator for adaptively transmitting the traffic data to the receiver according to the antenna method, the modulation and encoding method, and the transmit power determined by the modulation and encoding method and transmit power determining unit.

2. The adaptive transmitter of claim 1, wherein the modulation and encoding method and transmit power determining unit comprises:

a per-modulation-encoding-method target mean received SNR (signal to noise ratio) table for predefining target mean received SNR per modulation encoding method;

a transmit power increase table for establishing per-modulation-encoding-method compensated power values that correspond to the received log likelihood ratio parameter fed back from the receiver;

a transmit power determining unit for using the compensated power value output from the per-modulation-encoding-method target mean received SNR table and the compensated power value output from the transmit power increase table according to the received log likelihood ratio parameter value

and determining compensated power values of the corresponding antenna method, the modulation method, and the encoding method; and

an antenna/modulation/encoding method determining unit for determining the antenna method and the modulation and encoding method corresponding to the compensated power values determined by the transmit power determining unit, and outputting them to the encoder and modulator.

3. The adaptive transmitter of claim 1, wherein the received log likelihood ratio parameter includes a mean and a normalized standard deviation of the SNRs calculated by the receiver.

4. The adaptive transmitter of claim 1, wherein the modulation and encoding method and transmit power determining unit comprises:

a per-modulation-encoding-method target mean received SNR table for presetting target mean SNR per modulation encoding method;

a transmit power increase table for setting per-modulation-encoding-method compensated power values corresponding to the normalized standard deviation of the SNR fed back from the receiver;

a transmit power determining unit for using the target power output from the per-modulation-encoding-method target mean received SNR table, the compensated power value according to the fed-back mean received SNR, and the compensated power value output by the transmit power increase table according to the normalized standard deviation of the fed-back SNR, and determining the compensated power values on the corresponding antenna method and the modulation and encoding method; and

an antenna/modulation/encoding method determining unit for

determining the antenna method and the modulation and encoding method which correspond to the compensated power values determined by the transmit power determining unit, and outputting them to the encoder and modulator.

5. The adaptive transmitter of claim 3, wherein the received log likelihood ratio parameter includes a mean and a normalized standard deviation of the combined SNRs calculated by the receiver in the case of using diversity transmission,

the parameter includes a mean and a normalized standard deviation of the spatial channel SNRs calculated by the receiver in the case of using spatial multiplexing transmission, and

the parameter includes a mean and a normalized standard deviation of the combined SNRs calculated by the receiver, and a mean and a normalized standard deviation of the spatial channel SNRs calculated by the receiver in the case of using both diversity transmission and spatial multiplexing transmission.

6. An adaptive receiver in a wireless communication system using frequency division duplexing, comprising:

a demodulator and decoder for receiving signals from a transmitter, and demodulating and decoding the signals;

an SNR (signal to noise ratio) measuring unit for estimating a channel gain or an SNR in a single code block through a preamble or a pilot output by the demodulator and decoder; and

a received log likelihood ratio parameter determining unit for finding a parameter for determining a distribution of the received log likelihood ratio in a single code block from the channel gain or the SNR estimated by the SNR

measuring unit, and feeding the parameter back for adaptive transmission of the transmitter.

7. The adaptive receiver of claim 6, wherein the received log likelihood ratio parameter determining unit comprises:

a diversity received log likelihood ratio parameter determining unit for calculating combined SNRs from the channel gains or the SNRs estimated by the SNR measuring unit, determining a diversity received log likelihood ratio parameter, and outputting the parameter to the transmitter; and

a spatial multiplexing received log likelihood ratio parameter determining unit for calculating SNRs of spatial channels from the channel gains or the SNRs estimated by the SNR measuring unit, determining a spatial multiplexing received log likelihood ratio parameter, and outputting the parameter to the transmitter.

8. The adaptive receiver of claim 7, wherein the diversity received log likelihood ratio parameter determining unit comprises:

a combined channel gain calculator for receiving per-transmit/receive-antenna channel gain or SNR for each symbol in a single code block from the SNR measuring unit, and finding a combined channel gain and a combined SNR of each symbol in the code block; and

a mean and normalized standard deviation calculator for finding a mean and a normalized standard deviation of the combined SNRs in the single code block obtained from the combined channel gain calculator, setting them as the diversity received log likelihood ratio parameters, and feeding the parameters back to the transmitter.

9. The adaptive receiver of claim 7, wherein the spatial multiplexing received log likelihood ratio parameter determining unit comprises:

a spatial channel gain calculator for receiving a channel gain matrix of each symbol in the single code block from the SNR measuring unit, and finding singular values of the matrix or the SNR of the respective spatial channels; and

a mean and normalized standard deviation calculator for finding a mean and a normalized standard deviation of the spatial channel gain or the spatial channel SNR in the single code block found from the spatial channel gain calculator, setting them as the spatial multiplexing received log likelihood ratio parameters, and feeding the parameters back to the transmitter.

10. An adaptive transmitting method of a wireless communication system using frequency division duplexing, comprising:

(a) transmitting a pilot or a preamble to a receiver by using a predefined transmit power;

(b) determining an antenna method, a modulation and encoding method, and a transmit power based on the parameter (the received log likelihood ratio parameter) for determining the distribution of the received log likelihood ratio determined from the transmitted pilot or the preamble and fed back from the receiver; and

(c) transmitting traffic data to the receiver by using the determined antenna method, the modulation and encoding method, and the transmit power.

11. The adaptive transmitting method of claim 10, wherein (b) comprises presetting and storing the performance of all the antenna/modulation/encoding methods used by an adaptive transmitter with

respect to the pre-determined quantized values of the received log likelihood ratio parameter, and calculating transmit power needed for obtaining target performance on each antenna/ modulation/encoding method from the received log likelihood ratio parameter fed back from the receiver.

12. The adaptive transmitting method of claim 10, wherein (b) comprises finding a transmit power needed for further compensating for a mean received SNR for achieving target performance on the predefined antenna methods and the modulation and encoding methods, and a compensated transmit power for achieving target performance on the predefined antenna methods and the modulation and encoding methods from the received log likelihood ratio parameter fed back from the receiver.

13. The adaptive transmitting method of claim 10, wherein (b) comprises:

compensating for a difference between the mean received SNR for achieving target performance on the predefined antenna methods and the modulation and encoding methods and the mean received SNR fed back from the receiver; and

finding a transmit power so as to compensate for a compensated transmit power further needed for achieving target performance on the predefined antenna methods and the modulation and encoding methods from the normalized standard deviation of the fed-back SNR.

14. An adaptive receiving method of a wireless communication system using frequency division duplexing, comprising:

(a) estimating a complex channel gain (the complex channel gain being

from a transmit antenna to a receive antenna) of each symbol in a single code block through a pilot or a preamble transmitted from a transmitter;

(b) calculating the parameter (the received log likelihood ratio parameter) for determining the distribution of the received log likelihood ratio from the estimated complex channel gain (of from a transmit antenna to a receive antenna) of each symbol in a single code block; and

(c) feeding the calculated received log likelihood ratio parameter to the transmitter for adaptive transmission in the transmitter.

15. The adaptive receiving method of claim 14, wherein when the receiver uses diversity in (b), the combined channel gain h_l' of the l^{th} symbol in a code block and the combined SNR $\frac{|h_l'|^2}{2\sigma^2}$ are found by the subsequent equation

$$z = |h'|x + n''$$

$$|h'|^2 = \sum_{a=0}^{N_T-1} \sum_{b=0}^{N_R-1} |h_{a,b}|^2$$

where x is a transmit symbol with the normalized energy of 1, n" is complex normal noise with a mean value of 0 and a variance of $2\sigma^2$, N_T is a number of transmit antennas, N_R is a number of receive antennas, I includes a number of from 0 to L-1 (L is a number of symbols in the code block), and $h_{a,b}$ is a complex gain of from the a^{th} transmit antenna to the b^{th} receive antenna, and

a mean and a normalized standard deviation of the found combined SNR are the received log likelihood parameters.

16. The adaptive receiving method of claim 14, wherein when the receiver uses spatial multiplexing in (b), $\sqrt{\lambda_{i,l}}, i = 0,\ldots,N_T - 1$ which is the singular value of the channel gain matrix of the l^{th} symbol in a single code block, and the SNR $\frac{\lambda_{i,l}}{2\sigma^2}$ of respective spatial channels, are found by using a characteristic that the distribution of the received log likelihood ratio corresponds to the distribution of the log likelihood ratio received through channels having the number N_T of the antennas of the transmitter having the respective channel gains as $\sqrt{\lambda_i}$, and

a mean and a normalized standard deviation of the found spatial channel SNR are the received log likelihood parameters.